

Claims

We claim:

1. An abrader device for delivering a substance into skin via an abrasion process, said abrader device comprising:

a base having a top surface and a bottom surface onto which an abrader surface with microprotrusions is mounted, said microprotrusions having at least one scraping edge for forming a furrow along a length of the skin;

a handle projecting from the top surface of the base; and

means for controlling the amount of force or pressure applied to the microprotrusions as the abrader surface moves across the skin thereby forming a furrow of a substantially consistent depth along its length.

2. The abrader device according to Claim 1, further comprising a housing surrounding the base; wherein the handle is a push button that collapses inside the base when activated, and the base rotates with respect to the housing and proportionally to the push button collapse, thereby causing the abrader surface to rotate against skin when the housing is placed against skin.

3. The abrader device according to Claim 1, wherein said means for controlling the amount of force or pressure is a preloaded spring that deflects only if a sufficient amount of pressure is present.

4. The abrader device according to Claim 1, wherein said handle has an upper portion and a lower portion, said upper portion capable of collapsing onto said lower portion and said means for controlling the amount of force includes a spring surrounding a post where the spring and post are disposed in said lower portion and extend to said upper portion of the handle.

5. The abrader device according to Claim 4, wherein said means for controlling the amount of force is a printed matter gauge.

6. The abrader device according to Claim 5, wherein the printed matter gauge is color-coded.

7. The abrader device according to Claim 1, wherein the microprotrusions are of a depth of about 5 to about 250 microns.

8. The abrader device according to Claim 2, wherein said means for controlling the amount of force or pressure is a preloaded spring that deflects only if a sufficient amount of pressure is present, and further comprising a detent on said base that engages a portion of said pushbutton after said push button has been fully depressed wherein said detent retains said microprotrusions inside said housing

9. An abrader device for delivering a substance into skin via an abrasion process, said abrader device comprising:

a housing adapted to be pressed against the skin at a desired delivery site, said housing having a top with an upper opening and a bottom defining a lower opening, which surrounds the delivery site;

an applicator head disposed in the upper opening and movable across the lower opening to abrade the delivery site; and

an abrader surface attached to said applicator head whereby said housing remains firm and stationary at the delivery site and structure of said housing and said applicator head controls parameters of the abrasion process.

10. The abrader device according to Claim 9, wherein the structure of said housing that controls the abrasion process is a track that determines at least one of the length of the abraded area and the depth of penetration of the abrader surface into the skin at the delivery site.

11. The abrader device according to Claim 9, wherein said housing has a bottom edge that defines the lower opening, surrounds the skin at the delivery site and provides tension to the skin thereby promoting uniform skin abrasion.

12. The abrader device according to Claim 10, wherein said track is adjacent to the upper opening of said housing, said track including a notch extending laterally a distance where the distance is the abrasion path length.

13. The abrader device according to Claim 12, wherein said applicator head comprises a push button and a spring-loaded bar, and said abrader surface is attached to the spring-loaded bar, whereby when said push button is pressed or activated the spring of said spring-loaded bar exerts a defined and constant pressure on the abrader surface keeping it in contact with the skin while being moved laterally across the delivery site during the abrasion process.

14. The abrader device according to Claim 10, wherein said housing is a frame and the track is disposed on inner walls of the frame and said applicator head includes means for guiding said applicator head along the track.

15. The abrader device according to Claim 9, further comprising means for moving said applicator head and abrader surface across the delivery site.

16. The abrader device according to Claim 15, wherein said means for moving said applicator head and abrader surface first moves in one direction across the delivery site and then moves in the opposite direction to re-abrade the delivery site.

17. The abrader device according to Claim 13, wherein when the push button is pressed again, the spring is deactivated so that the abrader surface is pulled back within the housing away from the skin.

18. The abrader device according to Claim 9, wherein the housing is adapted to be fixedly attached to the delivery site of the skin.

19. An automatic abrader device for delivering a substance into skin via an abrasion process, said abrader device comprising:

a housing adapted to be fixedly attached to the skin at a desired delivery site, said housing having a top with an upper opening and a bottom with a lower opening;

a push button arranged to project through the upper opening of the housing;

a spring mechanism surrounding the push button;

a series of one or more levers or perpendicularly arranged horizontal bars in operable communication with said push button; and

an abrader surface movable across the lower opening of the housing to abrade the delivery site and in operable communication with said push button and said series of one or more levers or perpendicularly arranged horizontal bars wherein when the push button is pressed or activated said abrader surface moves into contact with the skin at the delivery site and moves across the delivery site in one direction in conjunction with the movement of said series of one of levers or perpendicularly arranged horizontal bars.

20. The automatic abrader device according to Claim 19, wherein said spring mechanism controls the speed at which the abrader surface moves across the skin.

21. The automatic abrader device according to Claim 19, wherein when said push button is pressed again or deactivated, the abrader surface moves in the opposite direction to return to its original position.

22. An abrader device for delivering a substance into skin via an abrasion process, said abrader device comprising:

a housing adapted to be attached to the skin at a desired delivery site, said housing having a top with an upper opening and a bottom with a lower opening, said lower opening facing the skin;

a push button arranged to project through the upper opening of the housing the push button having a first camming surface;

an abrader surface movable across the lower opening of the housing to abrade the delivery site and having a second camming surface in operable communication with said first camming surface wherein when said push button is pressed or activated said abrader surface moves into contact with the skin at the delivery site and moves across the delivery site from a first position to a second position in conjunction with the movement of said push button.

23. The abrader device according to Claim 22, further comprising a biasing spring wherein said biasing spring biases said abrader surface towards said first position.

24. The abrader device according to Claim 22, wherein said abrader surface travels in a substantially linear path from said first position to said second position.

25. The abrader device according to Claim 22, wherein said abrader surface travels in a substantially arcuate path from said first position to said second position.